Note technique – *Technical Note*		
	OBJET : Comparison of the complex and simplified CAL Simulation Thermal Models in static and transient mode	**Réf :** **GLAST-LLR-TN-057-B** **LAT Ref:** **LAT-TD-01191-02**
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This technical note presents comparison results between the simplified and complex CAL Simulation Thermal Models for the hot case (conductances mini). 2 complex models are used: one for the static analysis (3140) and the other for the transient analysis (1510 nodes) in order to limitate the simulation time. Radiative transfert with the tracker and conductive transfert with the TEM are not taken into account for this comparison.

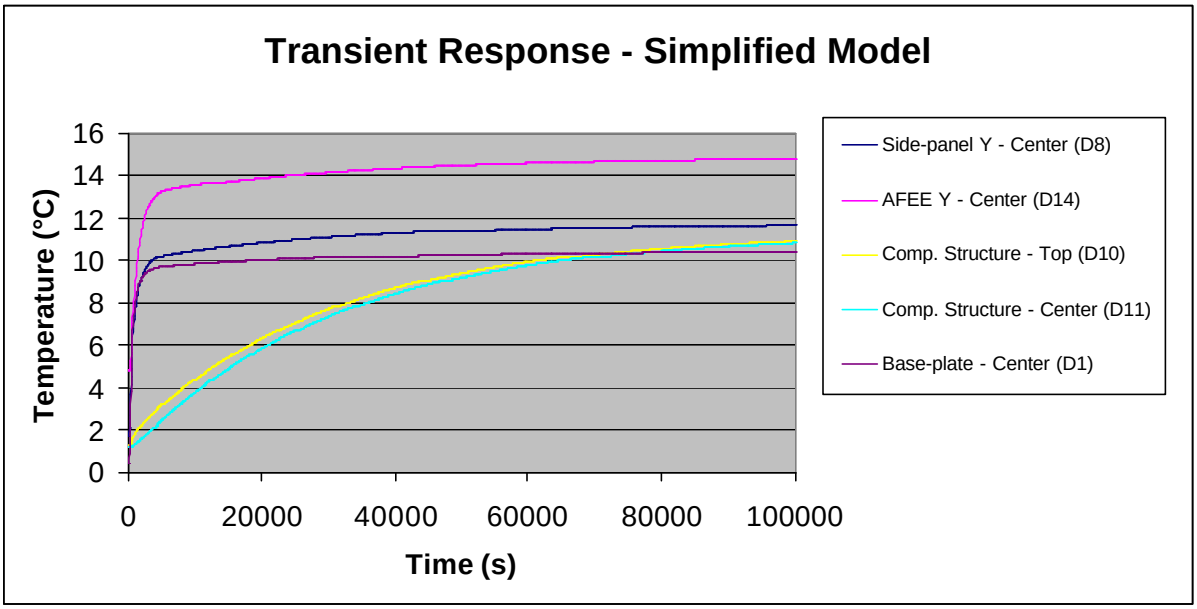
Static analysis:

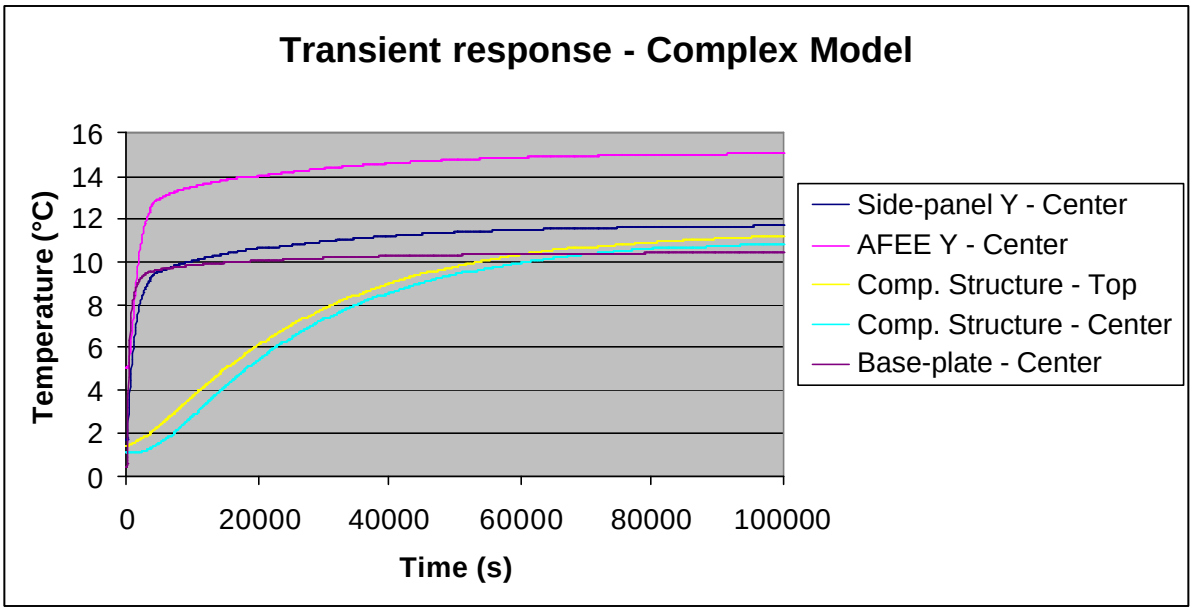
The Grid is maintained at 0°C :

N° Node	Location	.NODESET	TEMP. (°C) Simplified Model	TEMP (°C) Complex Model
1	Base Plate – Center	T(D1)	0,442	0,420
2	Base plate –Face X+ Side	T(D2)	0,422	0,404
3	Base plate –Face X- Side	T(D3)	0,422	0,404
4	Base plate –Y+ Side	T(D4)	0,422	0,392
5	Base plate – Center Face Y- Side	T(D5)	0,422	0,392
6	Side panel – Center Face X+	T(D6)	1,722	1,638
7	Side panel – Center Face X-	T(D7)	1,722	1,638
8	Side panel – Center Face Y+	T(D8)	1,722	1,497
9	Side panel – Center Face Y-	T(D9)	1,722	1,497
10	Composite Structure - Top	T(D10)	1,245	1,008
11	Composite Structure – Center	T(D11)	1,192	1,004
12	AFEE board – face X+	T(D12)	4,800	4,737
13	AFEE board – face X-	T(D13)	4,800	4,737
14	AFEE board – face Y+	T(D14)	4,800	5,044
15	AFEE board – face Y-	T(D15)	4,800	5,044
0	Grid	T(Grid)	0,000	0

Transient analysis :

A 10°C step is applied on the Grid. The rise time is equal to 60s : it is not realistic but allows to determinate the system time response.





Time constants at the center of the composite structure:

- simplified model: 31500 s
- complex model: 30800 s